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DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY TRAINING AND DOCTRINE COMMAND
102 MCNAIR DRIVE
FORT MONROE, VIRGINIA 23651-1047

REPLY TO
ATTENTION OF

ATMD

10 DEC 2004

MEMORANDUM FOR General Richard A. Cody, Vice Chief of Staff, U.S. Army, 201 Army Pentagon, Washington, D.C. 20310-0201

SUBJECT: Recommendation for Manufacturer-Treated Battle-Dress Uniforms (BDUs), Desert Camouflage Uniforms (DCUs), and Army Combat Uniforms (ACUs) with Permethrin

1. References:

a. Message, HQDA, DACS-ZD, 152335Z Nov 03, subject: Prevention, Treatment and Surveillance for Leishmaniasis in OIF/OEF.

b. Memorandum, Headquarters, U.S. Army Medical Command, MCCS, 10 Sep 04, subject: Guidance for the Management of Suspected Cutaneous Leishmaniasis in Operation Iraqi Freedom and Operation Enduring Freedom.

2. TRADOC strongly recommends:

a. All BDUs, DCUs, and ACUs (minus maternity uniforms) be treated with permethrin by the manufacturer.

b. Existing untreated stocks of BDUs and DCUs be treated with permethrin by industry professionals IAW EPA approved methods. Currently, the only contractors using EPA approved methods are Buzz Off Insect Shield LLC, headquartered in Greensboro, North Carolina, and Stabright, LLC, headquartered in Phoenix, Arizona.

3. Treatment of uniforms to prevent illness is a readiness and training Force Health Protection issue. Existing methods of insect-borne illness prevention, e.g., application of insect repellent to the skin (DEET) and individual/unit treatment of uniforms with permethrin, have not adequately prevented leishmaniasis, malaria, Rocky Mountain Spotted Fever, Ehrlichiosis, or Lyme disease in our Soldier population in training or in the contemporary operating environment (COE). It is clearly cost-effective for the Army to direct factory treatment of all uniforms (see Encl 1).

ATBO-M
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4. Previous concerns about the safety of permethrin in pregnancy have been alleviated by a recently published Health Hazard Assessment from the Center for Health Promotion and Preventive Medicine (see Encl 2).

5. We are an Army at War. We must protect the Soldiers training for War, and deploying to combat zones. Recommend immediate approval.

2 Encls

KEVIN P. BYRNES
General, U.S. Army
Commanding

15 November 2004

INFORMATION PAPER

1. **Purpose.** To provide justification and cost estimates for Permethrin pre-treatment options for Army Combat Uniforms (ACUs)

2. **Staff Recommendation:** With the proven and available state-of-the-art methodology associated with manufacturer-treated uniforms, neither TRADOC nor the Army can justify the present way of business (especially in an Army at War fighting in a high risk for insect-transmitted disease theater of operations). Permethrin treatment of uniforms is a readiness and training Force Health Protection issue that can be best resolved by manufacturer treatment of all Army field uniforms before distribution.

3. **Facts.**

a. From January 2003 to 27 October 2004, the Army recorded over 660 cases of Cutaneous Leishmaniasis, 71 cases of Malaria, and 9 cases of Lyme Disease (as well as 112 other arthropod-borne reportable disease incidents). Over 650 of these cases occurred in calendar year 2003 during the initial nine months of OIF (prior to the occupation or construction of climate-controlled sleeping quarters for US Soldiers).

b. Leishmaniasis, a chronic, disfiguring disease, can be successfully treated with Pentostam intravenously for 10-20 days, but it is administered under an investigational new drug (IND) protocol only provided at Walter Reed Army Medical Center (WRAMC) and Brooke Army Medical Center (BAMC). The estimated cost of treatment for one case of leishmaniasis ranges from $5,500 to $20,000, depending upon inclusion of travel (approximately $1,800 air evacuation cost from OIF to Andrews AFB via MilAir) and per diem costs to WRAMC or BAMC (not including lost duty time). A conservative cost of treating the 200 Soldiers evacuated from OIF for cutaneous leishmaniasis (CL) is $21.7 million. The cost of pre-treating their uniforms and potentially preventing their disease would have been as low as $4,800.

c. Currently, Armywide permethrin treatment of combat uniforms is accomplished by Individual Dynamic Absorption (IDA) kits, 2-

gallon sprayer, or aerosol cans at yearly effective costs per uniform of $3.90, $1.88, and $28.80 respectively. These methods have proven to be ineffective due to their piecemeal approach and improper management, leaving Soldiers minimally protected and vulnerable.

d. The training base does not currently issue or treat Soldiers' uniforms with permethrin. The CONUS Replacement Centers at Fort Benning and Fort Bliss issue IDA kits to personnel deploying to OIF or OEF for self-treatment of their uniforms. Use of the IDA kits by deploying personnel presents a challenge from the issuing of the kits, the time required to spray (or soak) and dry (24 hours), and kit disposal. This method requires significant organizational energy for minimal payoff, with an ineffective resupply and/or ability to re-treat in the COE. The aerosol can treatment, while logistically convenient, lasts only 6 washings, presents a risk to untrained troops from personal application, is difficult for unit commanders to verify, creates a large amount of waste, and is the most expensive treatment option. The 2-gallon sprayer technique has the lowest cost and reduces wastes, but requires highly trained and certified personnel to complete, is logistically difficult, requires at least 8 hours and a large amount of space to complete and could lead to environmental contamination of installations.

e. The newest technology (which ensures permanent treatment of uniforms with permethrin) has proven itself in the training environment, and in deployed populations, to significantly reduce the incidence of insect-borne illnesses. Clothing treatment with permethrin insecticide is an uncommonly safe solution developed by the USDA and DOD in the 1980s. It is EPA approved for many civilian uses, ***including clothing for pregnant travelers***. An added benefit for factory impregnation of uniforms is that it ***provides insect repellant protection for 50 washings (which usually exceeds the life of the uniform)***. The U.S. Military Academy contracted for the treatment of its uniforms for 2 years (2002, 2003), at a contracting cost of $40,000/year, or $8/uniform, greatly outweighing the cost of treating Lyme Disease among cadets, which was $455,830 in 2000 (**a net savings of $415,830/year**).

f. In late 2003, 80 Marines contracted Malaria while serving in Liberia. The cost of factory treatment of their uniforms would have been $11,600. The cost of medical treatment was $1,483,120. The Marine Corps is currently pursuing an across-the-board treatment of all new uniforms (excluding maternity

uniforms) in an effort to protect Marines from arthropod-borne illnesses. National Stock Numbers have been assigned to permethrin treated BDUs (PBDUs); however, they have never been stocked by the Defense Supply Center Philadelphia (DSCP) and cannot reasonably be obtained from DSCP.

g. Contracting for the pre-treatment of all uniforms, at a cost as low as $5.50 per uniform, removes all of the uncertainty from the process and commanders can be certain that their Soldiers have the absolute best protection available (range is $5.50-$8.00 per uniform depending upon quantity to be treated and shipping costs). Health risks to personnel from treatment are eliminated, and environmental risks to the installation (as well as insecticide refuse) are completely removed when treatment is accomplished prior to distribution. Contracting for the treatment would alleviate logistical and time constraints on already tapped resources.

MAJ Jennifer Cummings/ATBO-M/(757) 788-2097
APPROVED BY: COL J. G. Jolissaint

DEPARTMENT OF THE ARMY
U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
5158 BLACKHAWK ROAD
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REPLY TO
ATTENTION OF

MCHB-TS-OHH

16 August 2004

MEMORANDUM THRU U.S. Army Materiel Command (AMCPE-SG-H/LTC Nasir Siddique), 9301 Chapek Road, Fort Belvoir, VA 22060-5527

FOR Program Manager-Clothing and Individual Equipment (AMSRD-NSC-IP-A/ Ms. Kathy Swift), 10170 Beach Road, Fort Belvoir, VA 22060-5820

SUBJECT: Input to the Safety Confirmation for the Permethrin Treated Battledress Uniform (BDU), Health Hazard Assessment Program Project No. 69-MP-4540-04

1. References. A list of references is provided in Appendix A.

2. Summary.

a. The Army's Health Hazard Assessment (HHA) Program is an Army Medical Department initiative in cooperation with and in support of the Army Materiel Acquisition Decision Process. A specific objective of the program is to enhance soldier performance and readiness by minimizing the effects of health hazards in the workplace (e.g., field operations, training devices, weapon systems, and clothing/individual equipment). The proponent for the HHA Program is The Surgeon General (TSG); however, TSG has designated the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) as the Lead Agent. The HHA Program supports your compliance with HHA requirements contained in DODI 5000.2 and Army Regulations (ARs) (references 1-5).

b. We are providing you with information to support a Safety Confirmation for the upcoming Milestone C and type classification for the use of Battledress Uniforms (BDUs) factory-treated with the insect repellent permethrin, as requested in your memorandum (reference 6). The HHA Reports (HHARs), summarized below, are still valid, unless the concentration of permethrin applied to the BDU material has increased above 0.125 mg/cm^2.

Encl 2

3. The HHA Program has completed a number of HHARs on the use/application of permethrin to the soldier's BDU over the past 20 years. Matrixed input to the HHARs was provided by our Toxicity Evaluation, Entomology, and Occupational Medicine Programs. Those HHARs and HHA-related reports are summarized here:

a. 1984 (reference 7). Recommended approval for clothing impregnation with permethrin at a concentration of 0.125 mg/cm^2 and requested additional information on each proposed application process.

b. 1987 (reference 8). Provided a toxicity review and recommendation for the selection of permethrin containing emulsifiers, and exposure controls for on-site impregnation methods and storage of impregnated uniforms.

c. 1994 (references 9, 10, and 11).

(1) Permethrin exposures in the civilian manufacturing environment do not fall within the scope of the Army's HHA Program. The handling, use, storage and disposal of Permethrin is the responsibility of the chemical manufacturer and fabric finisher and subject to local, state, and federal occupational safety and health regulations.

(2) The National Research Council's Committee on Toxicology (COT) concluded:

(a) Soldiers wearing the permethrin impregnated BDU are highly unlikely to experience adverse health effects at the suggested Permethrin exposure level (fabric impregnation concentration of 0.125 mg/cm^2).

(b) The risk of adverse health effects in garment workers handling permethrin impregnated fabric is smaller, because their dermal exposure is estimated to be less than that of soldiers.

(c) Soldiers wearing the permethrin impregnated BDU in field operations will benefit from protection from tick and mosquito bites, which in turn will protect them from Lyme Disease, malaria, viral encephalitis, and other insect-transmitted diseases.

(d) There are some gaps in the toxicity and exposure data for permethrin; however, the COT believes there are sufficient data to conclude that the wearing of permethrin impregnated BDUs or working with permethrin impregnated fabric will not lead to adverse health effects in military personnel or garment workers.

(3) No additional recommendations were found to be necessary other than compliance with the recommendations provided in 1987 (reference 8).

4. The Army HHA Program assumed that the use of permethrin at the concentration of 0.125 mg/cm^2 for impregnating BDUs was approved and they were being provided to soldiers operating in areas with a high risk of exposure to biting arthropods. Arthropod exposures traditionally have resulted in large medical treatment costs and reduced readiness for Army units; now avoidable costs due to the use of permethrin impregnated BDUs and related equipment. Our assumption is based upon the facts that:

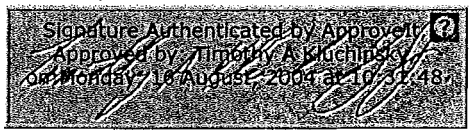
a. Allied military services are using permethrin treated BDUs.

b. The U.S. Centers for Disease Control and Prevention recommends the use of permethrin treated clothing, shoes, and bed nets for travelers (including children and pregnant women) (reference 12).

c. The application process is patented by the U.S. Army (reference 13) and commercially available permethrin impregnated clothing and related items are approved/registered by the U.S. Environmental Protection Agency for the general public's use (reference 14).

5. Direct inquiries regarding this matter to the undersigned or the HHA Program point of contact (POC), Mr. Robert Gross, at DSN 584-2925 or COM 410-436-2925. The contributing programs and POCs within USACHPPM include the Toxicity Evaluation (Dr. Will McCain, DSN 584-7388 or COM 410-436-7388) and Entomology (Ms. Sandra Evans, DSN 584-3613 or COM 410-436-3613) Programs. Please complete and return the electronic version of USACHPPM Form 323.

FOR THE COMMANDER:



TIMOTHY A. KLUCHINSKY, JR
MAJ, MS
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CF:
TRADOC
DLA/DES-E (Mr. Jan Reitman)

APPENDIX A

References

1. DODI 5000.2, Operation of the Defense Acquisition System, 12 May 03.

2. AR 40-10, Health Hazard Assessment Program in Support of the Army Materiel Acquisition Decision Process, 1 Oct 91.

3. AR 70-1, Army Acquisition Policy, 31 Dec 03.

4. AR 385-16, System Safety Engineering and Management, 2 Nov 01.

5. AR 602-2, Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process, 1 Jun 01.

6. Memorandum, PM-CIE, AMSRD-NSC-IP-A, undated, subject: Safety Confirmation for Permethrin Treated Battledress Uniform (BDU).

7. Memorandum, USAEHA, HSHB-OA, 26 Jul 84, subject: HHAR on Permethrin as an Insect/Arthropod Repellent Applied to Military Clothing, Project No. 69-37-4540-84.

8. 2nd End, USAEHA, HSHB-MO-A, 4 Aug 87, to memorandum, U.S. Army Medical Materiel Development Activity, SGRD-UMB, 11 May 87, subject: HHA of Permethrin as an Insect/Arthropod Repellent Applied to Military Clothing, Project No. 69-37-4540-87.

9. 2nd End, USACHPPM, MCHB-MO-A, 24 Aug 94, to memorandum, Project Manager-Soldier, AMCPM-SDR, 21 Jul 94, subject: Permethrin Treatment of the Desert BDU, Project No. 69-37-X3UA-94.

10. Health Effects of Permethrin-Impregnated Army BDUs, National Academy Press, National Research Council-Committee on Toxicology, Washington, DC, 1994.

11. Memorandum, National Research Council-Committee on Toxicology, 1 Aug 94, subject: Recommendations Regarding Further Research in the COT Report on Health Effects of Permethrin Treated BDUs.

12. The Yellow Book: Health Information for International Travel, 2003-2004, U.S. Centers for Disease Control and Prevention, Traveler's Health-Pregnancy, Breast-Feeding, and Travel (http://www.cdc.gov/travel/prenant.htm), Disease Specific Recommendations (http://www.cdc.gov/travel/children_disease_recs.htm), and Protection Against Mosquitoes and Other Arthropods (http://www.cdc.gov/travel/bugs.htm).

13. U.S. Patent and Trademark Office, Process and System for Impregnating Garments with Insect Repellant (U.S. Patent Nos. 5,884,418 and 5,930,909) (http://patft.uspto.gov).

14. USEPA, Office of Pesticide Programs, Notice of Pesticide Registration No. 74843-1 (3 Jan 03) and -2 (7 Jul 03).